UNITED STATES NAVAL OBSERVATORY

CIRCULAR NO. 22

U. S. Naval Observatory, Washington 25, D. C. September 18, 1950

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS
JULY, 1950

By Lucy T. Day

These results are based upon measurements made at the Naval Observatory on plates secured either there or at the Mt. Wilson Observatory. The symbols used for the entries in the successive columns are as follows:

U.T., the epoch of observation in Universal Time.
No., the identifying number of the group assigned by Mt. Wilson.
Δl, the heliographic difference in longitude from the central meridian, measured positive to the west.
φ, the heliographic latitude, measured positive to the north.
ρ, the heliocentric angular distance from the line joining the centers of the Earth and Sun.
A, the true area of the umbra plus penumbra, expressed in millionths of the visible hemisphere.
s, the number of spots.

An asterisk means that no Mt. Wilson number was assigned. Plates secured at the Naval Observatory are indicated by N, and those at Mt. Wilson by W. The plate quality, which follows, is indicated by:

1, Poor; 2, Fair; 3, Good; 4, Very Good; 5, Excellent.

The following five quantities are listed successively at the end of each day, and give for that day:

1. The total number of groups, g.
2. The longitude of the central meridian, L_0.
3. The latitude of the center of the disc, B_0.
4. The total value of A.
5. The total value of s.

The mean daily area and the mean relative sunspot number, $r=10g+s$ are given at the end of the month.

These results are a continuation of those published in the *Monthly Weather Review* from February 1, 1927 to December 31, 1947.

JULY

U.T.	No.	Δl	φ	ρ	A	s
		°	°	°		
1,699	10397	−53	−29	60	48	1
N−4	10397	−47	−26	54	48	2
	10395	−48	+20	50	194	1
	(*)	+22	−17	30	12	5
	10393	+40	−19	45	12	2
	10393	+47	−17	51	145	11
	10398	+43	−13	46	145	19
	10388	+71	−13	74	24	1
	(6)	(326)	(+3)		628	42
2,572	10397	−40	−27	48	16	5
W−4	10397	−34	−25	43	36	4
	10395	−36	+20	38	194	1
	10393	+52	−19	57	12	7
	10393	+59	−17	62	73	7
	10393	+63	−19	66	57	13
	10398	+53	−13	56	121	16
	10398	+60	−14	63	170	9
	(4)	(315)	(+3)		679	62
3,640	10395	−24	+20	28	194	1
N−3	10397	−20	−26	35	48	4
	10398	+66	−14	68	145	8
	10398	+75	−15	76	194	1
	10393	+75	−20	78	48	6
	(4)	(301)	(+3)		629	20
4,690	(*)	−29	+12	41	12	3
N−3	10399	−18	+15	22	73	10
	10399	−16	+13	18	61	6
	10395	−11	+20	20	194	1
	10397	−11	−27	32	12	2
	10398	+80	−13	80	97	1
	(5)	(287)	(+3)		449	23
5,670	10400	−85	−21	85	121	1
N−2	10399	− 4	+15	13	97	5
	10399	0	+13	10	121	4
	10395	+ 3	+20	17	194	1
	(3)	(274)	(+3)		533	11
7,668	10400	−57	−20	61	242	1
N−4	10399	+22	+16	25	218	6
	10399	+27	+12	28	194	1
	10399	+28	+13	30	12	2
	10399	+30	+11	32	73	2
	10395	+30	+21	35	145	1
	10303	+60	+20	60	121	5
	10403	+65	+18	65	145	1
	10402	+66	−12	68	12	1
	10401	+78	+ 6	78	97	2
	10401	+80	+ 9	80	194	1
	(6)	(247)	(+4)		1453	23
8,647	10400	−43	−20	48	194	1
N−3	10399	+35	+16	37	291	8
	10399	+44	+11	44	48	4
	10399	+46	+13	47	267	5
	10395	+42	+20	43	145	1
	10403	+72	+20	72	291	4
	10403	+80	+17	80	194	1
	(4)	(234)	(+4)		1430	24

U.T.	No.	Δl	φ	ρ	A	s
		°	°	°		
10,716	10406	−80	+22	80	242	3
N−4	10406	−73	+20	73	388	14
	10406	−65	+19	65	12	1
	10400	−19	−20	30	12	6
	10400	−17	−19	29	218	1
	10405	+29	+ 6	29	61	6
	10405	+31	+ 4	31	24	4
	10405	+34	+ 5	34	61	5
	10399	+62	+16	62	291	4
	10399	+70	+11	70	242	3
	10399	+75	+ 9	75	24	1
	10395	+70	+20	70	109	1
	(5)	(207)	(+4)		1684	49
11,650	10406	−68	+22	68	291	5
N−3	10406	−62	+17	62	6	1
	10406	−60	+20	60	218	6
	10406	−58	+20	58	145	9
	(*)	− 7	+16	21	16	4
	10400	− 3	−19	23	218	1
	10405	+42	+ 8	42	145	4
	10405	+45	+ 6	45	48	16
	10399	+75	+15	75	194	1
	10399	+75	+17	75	97	1
	10399	+82	+10	82	145	2
	(5)	(195)	(+4)		1523	50
12,560	10406	−55	+22	56	145	8
W−3	10406	−51	+21	53	73	2
	10406	−51	+17	53	12	1
	10406	−49	+20	51	145	4
	10406	−46	+19	47	145	7
	10400	+11	−19	25	218	1
	10405	+54	+ 6	54	48	1
	10405	+55	+ 8	55	61	1
	10405	+57	+ 7	57	73	4
	10405	+59	+ 6	59	12	1
	(3)	(183)	(+4)		932	30
13,674	10408	−40	−15	44	12	7
N−4	10408	−38	−15	43	36	1
	10406	−39	+21	42	97	12
	10406	−33	+19	35	291	30
	10407	+ 5	+33	30	12	5
	10400	+25	−19	33	194	1
	10405	+70	+ 6	70	24	1
	10405	+71	+ 8	71	97	3
	10405	+77	+ 4	77	48	1
	(5)	(168)	(+4)		811	61
14,588	10409	−66	+ 9	66	12	1
W−3	10408	−28	−14	32	48	4
	10408	−25	−12	30	36	9
	10406	−27	+22	32	61	25
	10406	−21	+17	24	24	5
	10406	−19	+20	25	145	30
	10407	+17	+34	34	16	4
	10400	+38	−19	44	194	1
	(5)	(156)	(+4)		536	79
15,564	10411	−86	+ 8	86	339	1
W−3	(*)	−66	+13	66	12	5
	10409	−52	+ 9	52	6	1
	10406	−19	+24	26	24	5

JULY

U.T.	No.	Δl	φ	ρ	A	s
		°	°	°		
	10406	−15	+22	23	61	10
	10406	− 8	+17	17	36	9
	10406	− 7	+20	18	121	18
	10408	−17	−14	24	24	7
	10408	−11	−12	19	36	15
	10400	+50	−19	54	194	1
	(6)	(143)	(+4)		853	72
16.788	10411	−70	+ 9	70	339	1
N–2	10412	−49	+14	50	48	1
	10412	−49	+11	49	24	5
	10412	−46	+12	46	97	4
	10413	− 8	+25	24	6	1
	10413	− 5	+22	19	6	1
	10408	0	−13	17	48	1
	10408	+ 5	−12	17	61	3
	10406	+ 7	+17	15	24	7
	10406	+ 9	+20	18	97	4
	10400	+66	−19	68	194	1
	(6)	(127)	(+4)		944	29
17.649	10411	−59	+ 9	59	12	4
N–4	10411	−58	+ 8	58	388	1
	10412	−37	+13	38	121	13
	10412	−32	+11	33	242	9
	10408	+12	−13	22	48	8
	10408	+17	−12	23	73	7
	10406	+20	+17	24	12	6
	10406	+21	+20	26	97	7
	10400	+79	−19	79	194	1
	(5)	(115)	(+5)		1187	56
18.716	10415	−86	−13	86	630	1
N–3	10411	−44	+ 8	44	388	1
	10411	−44	+11	44	6	3
	10414	−31	+ 3	31	12	1
	10412	−24	+12	25	145	7
	10414	−19	+11	20	339	5
	10408	+31	−12	35	48	2
	10406	+35	+20	37	73	1
	(6)	(101)	(+5)		1641	21
19.649	10417	−80	+ 4	80	170	1
N–3	10415	−71	−14	72	727	1
	10416	−31	+15	33	12	5
	10411	−31	+ 8	31	388	1
	10412	−10	+12	12	145	14
	10412	− 5	+11	8	485	2
	10412	− 6	+ 8	7	6	1
	10406	+42	+19	43	24	4
	10406	+47	+20	48	97	7
	10406	+49	+15	50	12	2
	(6)	(89)	(+5)		2066	38
20.658	10418	−79	−13	79	145	1
N–4	10417	−67	+ 4	67	242	1
	10415	−58	−14	60	679	1
	10411	−19	+ 9	20	24	10
	10411	−18	+ 8	18	339	1
	10412	+ 4	+12	7	194	35
	10412	+ 8	+11	11	533	1
	10406	+55	+20	57	12	1
	10406	+60	+18	60	48	2
	10406	+62	+15	62	12	2
	(6)	(75)	(+5)		2228	55
21.826	10418	−61	−13	63	97	1
N–3	10417	−51	+ 4	51	194	1
	10417	−50	+ 5	50	12	6
	10415	−43	−17	48	12	3
	10415	−43	−14	47	145	6
	10415	−41	−14	45	485	1
	10420	− 3	+13	8	12	1
	10411	− 3	+ 9	4	16	2
	10411	− 1	+ 8	3	339	1
	10411	+ 1	+ 6	1	97	10
	10412	+18	+11	19	291	20
	10412	+23	+11	24	485	1
	10419	+55	+20	57	12	4
	(7)	(60)	(+5)		2197	57
22.649	10418	−50	−13	53	97	1
N–3	10417	−40	+ 5	40	48	5
	10417	−40	+ 4	40	194	1
	10415	−33	−14	38	145	9
	10415	−31	−13	35	582	1
	10421	−17	+ 3	17	48	4
	10420	+ 8	+10	10	97	8
	10420	+ 8	+12	11	73	9
	10411	+ 9	+ 8	10	291	1
	10411	+ 8	+ 5	8	12	4
	10412	+29	+11	30	97	25
	10412	+32	+11	33	485	2
	(7)	(40)	(+5)		2169	70
23.569	10418	−36	−13	40	73	8
W–3	10417	−29	+ 8	29	24	12
	10417	−28	+ 5	28	194	1
	10415	−22	−14	29	97	22
	10415	−19	−12	24	582	1
	10421	− 3	+ 3	3	12	5
	10420	+20	+12	22	73	7
	10420	+22	+14	23	36	6
	10411	+20	+ 5	20	12	1
	10411	+21	+ 9	22	242	4
	10411	+24	+ 9	25	12	3
	10412	+42	+11	42	61	20
	10412	+46	+11	46	73	3
	10412	+47	+11	47	388	1
	(7)	(37)	(+5)		1879	94
24.754	10423	−68	−12	69	97	1
N–3	10418	−22	−12	27	24	3
	10418	−22	−13	29	48	1
	10417	−13	+ 5	13	170	1
	10415	− 7	−15	21	97	11
	10415	− 4	−15	20	533	1
	10421	+13	+ 3	13	24	3
	10411	+35	+ 8	35	242	1
	10420	+37	+11	38	48	5
	10412	+59	+10	59	48	6
	10412	+61	+11	61	485	1
	(8)	(21)	(+5)		1816	34

JULY

U.T.	No.	Δl	φ	ρ	A	s
		°	°	°		
25.647	10423	−61	−12	63	97	4
N−3	10423	−58	−11	60	12	2
	10423	−56	−12	57	170	10
	10424	−19	−18	30	48	5
	10418	−10	−13	20	48	1
	10417	0	+ 5	0	97	6
	10415	+ 6	−17	23	61	11
	10415	+ 6	−12	18	24	7
	10415	+ 9	−14	21	533	1
	10411	+48	+ 6	48	242	1
	10420	+50	+10	50	24	1
	10412	+73	+11	73	582	1
	(8)	(9)	(+5)		1938	50
26.566	10423	−49	−12	51	121	6
W−3	10423	−45	− 9	47	16	4
	10423	−42	−10	44	145	14
	10426	−11	+ 8	12	12	10
	10424	− 7	−18	24	85	18
	10418	+ 4	−13	18	12	1
	10425	+11	+ 1	12	6	1
	10417	+13	+ 5	13	85	6
	10415	+17	−15	25	24	30
	10415	+21	−13	28	533	1
	10415	+21	−10	26	12	5
	10420	+59	+10	59	24	9
	10420	+65	+11	65	6	1
	10411	+61	+ 7	61	218	1
	(9)	(357)	(+5)		1299	107
27.651	10428	−62	+13	62	6	3
N−4	10427	−56	−22	60	12	1
	10423	−38	−13	43	194	1
	10423	−35	−12	38	121	8
	10423	−30	−10	33	24	7
	10423	−28	−12	32	97	6
	10426	+ 5	+ 7	5	12	3
	10424	+ 7	−20	26	61	5
	10424	+ 9	−18	24	36	4
	10418	+18	−13	24	12	1
	10417	+28	+ 5	28	48	8
	10415	+31	−16	38	24	7
	10415	+37	−13	41	582	1
	10420	+73	+10	73	12	1
	10411	+75	+ 6	75	218	1
	(10)	(343)	(+5)		1459	57
28.644	10432	−80	+ 7	80	170	1
N−3	10431	−60	+19	60	12	1
	10427	−42	−20	48	6	1
	10423	−25	−13	30	194	1
	10423	−23	−12	29	48	3
	10423	−20	−12	26	48	2
	10423	−17	−10	23	36	9
	10423	−15	−12	22	97	3
	10424	+20	−19	31	48	5
	10418	+29	−14	33	12	4
	10430	+39	+ 4	39	48	2
	10415	+49	−13	52	558	1
	10429	+57	+ 6	57	73	7
	(9)	(330)	(+5)		1350	40
29.655	10434	−86	−11	86	291	2
N−3	10434	−81	− 8	81	291	1
	10432	−68	+ 7	68	267	1
	10433	−50	− 7	53	24	5
	10423	−13	−13	23	170	5
	10423	−12	−12	22	48	4
	10423	−10	−11	20	24	6
	10423	− 7	−11	18	6	1
	10423	− 5	−13	20	48	4
	10433	− 3	−12	18	97	4
	10424	+32	−18	41	6	1
	10418	+44	−14	49	12	1
	10430	+53	+ 4	53	12	5
	10415	+63	−12	66	582	1
	10429	+71	+ 7	71	48	1
	(9)	(316)	(+6)		1926	42
30.669	10434	−75	−10	75	48	4
N−3	10434	−69	−11	71	388	1
	10434	−67	− 9	69	533	6
	10432	−55	+ 7	55	242	1
	10432	−50	+ 8	50	24	9
	10423	+ 2	−13	19	97	4
	10423	+ 4	−12	19	48	7
	10423	+ 8	−11	19	24	10
	10423	+11	−13	22	145	5
	10418	+57	−14	61	24	4
	10415	+77	−12	79	582	1
	(5)	(303)	(+6)		2155	52
31.643	10434	−61	−10	63	24	2
N−3	10434	−58	−12	61	12	2
	10434	−57	−10	59	630	2
	10434	−51	− 8	54	97	7
	10434	−49	− 9	52	206	1
	10432	−41	+ 7	41	218	1
	10423	+15	−13	25	97	8
	10423	+21	−11	28	6	2
	10423	+25	−13	32	73	5
	(3)	(290)	(+6)		1363	30

Mean for 28 days, A=1371, r=106.8